

What is claimed is:

1. An arithmetic and logic unit using a half adder, comprising:
 - a half adder using a superconductor rapid single flux quantum logic device as a logic circuit; and
 - a switching unit that has input ports each connected to a sum output port and a carry output port of the half adder and is operated as an OR gate, an AND gate, an adder gate and an exclusive OR gate using output signals of the half adder,
 - wherein the switching unit includes
 - a first switch having an input port connected to the sum output port of the half adder;
 - a second switch having an input port connected to the carry output port of the half adder and an output port connected to an output port of the first switch; and
 - a third switch having an input port connected to the carry output port of the half adder.
2. The arithmetic and logic unit as claimed in claim 1, wherein the first, second and third switches include Josephson junctions obtained by weakly combining two superconductors with each other.